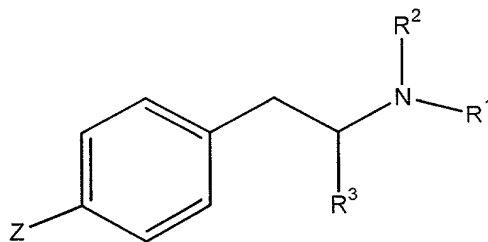


## CLAIMS

1. A compound having a structure



wherein:

R<sup>1</sup> is an alkyl group comprising 2-6 carbon atoms;

R<sup>2</sup> is selected from the group consisting of hydrogen, an alkyl group, and a protecting group;

R<sup>3</sup> is an optionally substituted alkyl group; and

Z is -L-X-Q; wherein

L comprises 1-15 carbon atoms and 0-6 heteroatoms;

X is selected from the group consisting of -O-, -CO-, -NR<sup>4</sup>-, -S-, -C(=NH)O-, -NH(CO)-, -NH(CO)NH-, -NH(CS)-, -NH(CS)NH-, -O(CO)NH-, -NH(C=NH)-, and maleimidothioether, wherein R<sup>4</sup> is selected from the group consisting of hydrogen and an alkyl group; and

Q is selected from the group consisting of hydrogen, a hydroxyl, a leaving group, a macromolecular carrier, and a label.

2. The compound of claim 1 wherein the macromolecular carrier is selected from the group consisting of a protein, a polypeptide, and a polysaccharide.

3. The compound of claim 2 wherein the protein is selected from the group consisting of keyhole limpet hemocyanin, bovine serum albumin, and bovine thyroglobulin.

5 4. The compound of claim 1 wherein  $R^2$  is a protecting group or hydrogen.

5. The compound of claim 4 wherein L comprises 1-11 carbon atoms.

10 6. The compound of claim 5 wherein L is  $-(CH_2)_j-$  and j is 1, 2, 3, 4, 5, or 6.

15 7. The compound of claim 6 wherein j is 3 and X is  $-CO-$ .

8. The compound of claim 7 wherein  $R^1$  is selected from the group consisting of ethyl, n-propyl, and n-butyl, and  $R^3$  is selected from the group consisting of methyl, ethyl, n-propyl, and n-butyl.

20 9. The compound of claim 7 wherein Q is a leaving group

10. The compound of claim 7 wherein  $R^1$  is ethyl and  $R^3$  is methyl.

11. The compound of claim 10 wherein Q is a leaving group.

25 12. The compound of claim 7 wherein Q is a leaving group comprising N-oxysuccinimide.

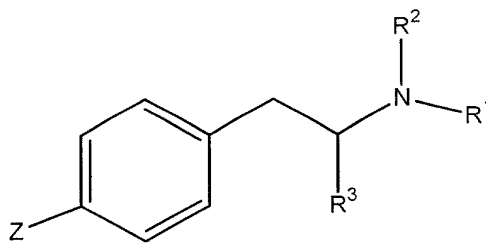
30 13. The compound of claim 10 wherein Q is a leaving group comprising N-oxysuccinimide.

14. The compound of claim 7 wherein Q is a macromolecular carrier selected from the group consisting of a hemocyanin, a globulin, an albumin, and a polysaccharide.

15. The compound of claim 10 wherein Q is a macromolecular carrier selected from the group consisting of a hemocyanin, a globulin, an albumin, and a polysaccharide.

16. An antibody specific for MDEA.

17. An antibody specific for an analyte wherein the analyte comprises a structure



wherein:

R<sup>1</sup> is an alkyl group comprising 2-6 carbon atoms;

R<sup>2</sup> is selected from the group consisting of hydrogen, an alkyl group, and a protecting group;

R<sup>3</sup> is an optionally substituted alkyl group; and

Z is -L-X-Q; wherein

L comprises 1-15 carbon atoms and 0-6 heteroatoms;

X is selected from the group consisting of -O-, -CO-, -NR<sup>4</sup>-, -S-, -C(=NH)O-, -NH(CO)-, -NH(CO)NH-, -NH(CS)-, -NH(CS)NH-, -O(CO)NH-, -NH(C=NH)-, and maleimidothioether, wherein R<sup>4</sup> is selected from the group consisting of hydrogen and an alkyl group; and

Q is selected from the group consisting of hydrogen, a hydroxyl, a leaving group, a macromolecular carrier, and a label.

5           18.    The antibody of claim 17 wherein the macromolecular carrier is selected from the group consisting of a protein, a polypeptide, and a polysaccharide.

10           19.    The antibody of claim 17 wherein the protein is selected from the group consisting of keyhole limpet hemocyanin, bovine serum albumin, and bovine thyroglobulin.

15           20.    The antibody of claim 17 wherein  $R^2$  is a protecting group or hydrogen.

20           21.    The antibody of claim 20 wherein L comprises 1-11 carbon atoms.

25           22.    The antibody of claim 21 wherein L is  $-(CH_2)_j-$  and j is 1, 2, 3, 4, 5, or 6.

30           23.    The antibody of claim 22 wherein j is 3 and X is  $-CO-$ .

35           24.    The antibody of claim 23 wherein  $R^1$  is selected from the group consisting of ethyl, n-propyl, and n-butyl, and  $R^3$  is selected from the group consisting of methyl, ethyl, n-propyl, and n-butyl.

40           25.    The antibody of claim 23 wherein  $R^1$  is ethyl and  $R^3$  is methyl.

45           26.    The antibody of claim 23 wherein Q is a macromolecular carrier selected from the group consisting of a hemocyanin, a globulin, an albumin, and a polysaccharide.

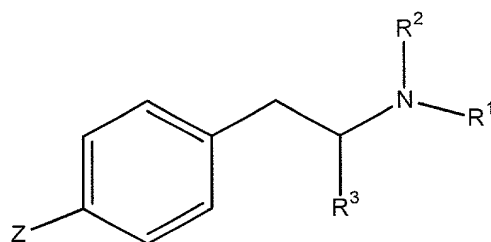
27. The antibody of claim 25 wherein Q is a macromolecular carrier selected from the group consisting of a hemocyanin, a globulin, an albumin, and a polysaccharide.

28. A reagent kit comprising the antibody of claim 16.

29. A reagent kit comprising the antibody of claim 17.

30. A reagent kit comprising the antibody of claim 27.

31. A method of producing an antibody comprising inoculating a host with an immunogen comprising a structure



wherein:

$R^1$  is an alkyl group comprising 2-6 carbon atoms;

$R^2$  is selected from the group consisting of hydrogen, an alkyl group, and a protecting group;

$R^3$  is an optionally substituted alkyl group; and

Z is  $-L-X-Q$ ; wherein

L comprises 1-15 carbon atoms and 0-6 heteroatoms;

X is selected from the group consisting of  $-O-$ ,  $-CO-$ ,  $-NR^4-$ ,  $-S-$ ,  $-C(=NH)O-$ ,  $-NH(CO)-$ ,  $-NH(CO)NH-$ ,  $-NH(CS)-$ ,  $-NH(CS)NH-$ ,  $-O(CO)NH-$ ,  $-NH(C=NH)-$ , and maleimidothioether, wherein  $R^4$  is

selected from the group consisting of hydrogen and an alkyl group; and

Q is a macromolecular carrier.

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32. The method of claim 31 wherein  $R^2$  is a protecting group or hydrogen.

33. The method of claim 32 wherein L comprises 1-11 carbon atoms.

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34. The method of claim 33 wherein L is  $-(CH_2)_j-$  and j is 1, 2, 3, 4, 5, or 6.

35. The method of claim 34 wherein j is 3 and X is  $-CO-$ .

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36. The method of claim 35 wherein  $R^1$  is selected from the group consisting of ethyl, n-propyl, and n-butyl, and  $R^3$  is selected from the group consisting of methyl, ethyl, n-propyl, and n-butyl.

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37. The method of claim 35 wherein  $R^1$  is ethyl and  $R^3$  is methyl.

38. The method of claim 35 wherein Q is a macromolecular carrier selected from the group consisting of a hemocyanin, a globulin, and an albumin.

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39. The method of claim 37 wherein Q is a macromolecular carrier selected from the group consisting of a hemocyanin, a globulin, and an albumin.

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40. A method of detecting an analyte in a sample comprising:  
contacting the sample with the antibody of claim 16;  
binding the antibody to the analyte; and

detecting an adduct formed by the antibody and the analyte.

41. The method of claim 40 wherein the analyte is selected from the group consisting of an amphetamine, an amphetamine derivative, an ecstasy drug, an ecstasy drug derivative, and combinations thereof.

42. The method of claim 41 wherein the ecstasy drug is MDEA.

43. A method of detecting an analyte in a sample comprising:  
contacting the sample with the antibody of claim 17;  
binding the antibody to the analyte; and  
detecting an adduct formed by the antibody and the analyte.

44. The method of claim 43 wherein the analyte is selected from the group consisting of an amphetamine, an amphetamine derivative, an ecstasy drug, an ecstasy drug derivative, and combinations thereof.

45. The method of claim 44 wherein the ecstasy drug is MDEA.